

BIOLOGICAL EVALUATION OF THE SARATOGA SPITTLEBUG  
SITUATION ON THE NICOLET & CHEQUAMEGON N.F.  
C.S. 1966

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A. Introductory Statement

Saratoga spittlebug populations the last few years have been at a low ebb; damage from this insect has been correspondingly low. This year, however, during my aerial detection survey of the Lakewood District, a 75-acre red pine plantation was noted to have considerable "flagging" and top kill in it. The causal agent, determined by a followup ground check by myself, was the Saratoga spittlebug.

The plantation was adult surveyed (scar-counted) in 1963; results of the survey indicated that some damage might occur the following year, but a damaging nymphal population during the spring of 1964 did not develop. No damage in the plantation was detected during the 1965 aerial detection survey made by myself. The plantation was then scheduled to be adult surveyed during the fall of this year along with another 3600 acres of red pine plantations on the Nicolet and Chequamegon National Forests.

B. Technical Information

1. Causal Agent - Aphrophora saratogensis (Fitch), the Saratoga spittlebug.
2. Host Tree Attacked - Red Pine, Pinus resinosa is the primary host.
3. Type of Damage - Quite severe in some areas; losses involve tree-killing, top killing and considerable flagging which has a detrimental effect on tree growth and vigor.
4. Biological Data - The effectiveness of parasitism and/or predation on the outbreak is unknown at this time.
5. Environmental Factors - Very dry conditions this summer were thought earlier to have curtailed the nymphal populations, but scar-counts indicate that the populations have remained high. Weather conditions in the spring are usually not severe enough to kill many of the nymphs, but a prolonged cold spell next spring during normal emergence time could drastically affect the population.

6. Extent of Outbreak - Including the 75-acre red pine plantation on the Lakewood District, the outbreak consists of approximately 650 acres of red pine plantations on the Nicolet and Chequamegon National Forests.

7. Location of Outbreak - See attached maps.

8. Discussion - This evaluation is based entirely on the scar-count survey and the visual condition of the plantations affected. The final portion of this evaluation will be a nymphal survey of the infested plantations next spring.

Generally speaking, if 30% or more of the plots taken during a scar-count survey on a plantation fall into the heavy damage category (30+ scars/10 cm of 2 year old internode twig) the plantation is scheduled for definite control the following year. If infested trees exhibit 30 or more scars/10 cm. twig, flagging and growth deterioration will generally occur with 1 or 2 seasons. In addition, a plantation can be scheduled for possible control the following year if the heavy damage and medium damage (10-30 scars/10cm. twig) categories constitutes 30% of the plots taken; the assumption here being that the medium damage population has a good chance of increasing to a heavy damage population after it has gone through the propagative stage.

The following is a table showing the results of the 1966 scar-count surveys on the Nicolet and Chequamegon National Forests.

Scar-Count Plots

District	Plan #	Acreage	#Heavy	#Medium	Av. Free Ht.,	#Scars/10 cm. Twig
Florence	P-F2b	20	0	47	5 <sup>1</sup>	6
	P-6c	48	5	40	10 <sup>1</sup>	9
	F17b	29	0	60	9 <sup>1</sup>	13
Three Lakes	P-46a	7	0	50	3 <sup>1</sup>	9
Lakewood	#P-3	12	27	40	9 <sup>1</sup>	22
	#P-5a	22	27	47	4 <sup>1</sup> $\frac{1}{2}$ <sup>1</sup>	21
	#P-4a	24	40	27	6 <sup>1</sup>	25
	P-2	15	7	47	9 <sup>1</sup>	15
	#P-1	75	40	33	9 <sup>1</sup>	35
	-P-2	70	20	13	6 <sup>1</sup>	9
Park Falls	P-1	46	0	33	10 <sup>1</sup>	7
	P-45b	67	41	35	11 $\frac{1}{2}$ <sup>1</sup>	31
Washburn	P-91 (So.	106	10	43	6 $\frac{1}{2}$ <sup>1</sup>	11
Hayward	P-56b Blk.)	13	0	30	3 $\frac{1}{2}$ <sup>1</sup>	6
	#P-47a	10	40	10	8 $\frac{1}{2}$ <sup>1</sup>	24
	P-35b	15	13	47	11	12
	#P-50a	10	30	30	9	23
Glidden	P-48a	10	10	50	9	24
	P-39a	48	10	45	13	22

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The inherent vigor of a particular tree, or of the whole plantation for that matter, can have a considerable effect on just how much spittlebug damage it can incur without exhibiting damage symptoms, i.e., mortality, topkill, flagging, or growth loss. For that reason, the generalization of 30% heavy damage or 30% heavy plus medium damage constituting control conditions cannot be adhered to religiously. Each plantation listed above will be examined by me prior to next spring to determine just how the tree vigor insect damage have meshed.

9. Recommendations - Several of the plantations listed in the above table exhibit extreme spittlebug damage, including tree mortality. This damage will increase next year if the spittlebug populations are not suppressed either by adverse weather conditions or applied chemical control. The remaining plantations listed in the table are harboring potentially damaging spittlebug populations.

My biological recommendation is to schedule control next summer on the plantations marked with an asterisk and schedule all of the plantations for nymphal surveys next spring . . . an average of about one spittlebug nymph per tree unit - product of average tree height (in feet), the average number of living branch whorls, and the average number of trees/acre - will result in 35 scars/10 cm. twig and serious tree damage.

**COST-BENEFIT EVALUATION OF THE SARATOGA SPITTLEBUG  
SITUATION ON THE NICOLET NATIONAL FOREST  
POSSIBLE CONTROL IN 1967**

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**I. Cost**

About 200 acres of red pine plantations are on the Lakewood District are immediately threatened by the recent buildup in populations of the spittlebug. Decreased tree vigor and some mortality can be expected to result unless control measures are undertaken. Chemical control of the populations can be carried out at an expected cost of \$6 per acre.

**II. Benefits**

Damage caused by the spittlebug can be expected to decrease the site index of these plantations from an average of 60 to 55, resulting in a present value decrease from \$129 per acre to \$110 per acre. Actual mortality causing the destruction of the entire stands would, of course, require reforestation reflecting greater losses.

**ADVERSE EFFECTS**

News releases and radio programs will be used to inform the public of this project. All precautions will be taken to prevent drift, etc. No adverse effects are anticipated.